

Writing Exponential Functions

-Recall: An Exponential Function is of the form

$y = a(b)^x$, where:

$a =$ _____

$b =$ _____

-The growth/decay factor, b , is equal to _____

where:

$1 =$ _____

$r =$ _____

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Writing Exponential Functions:

1) Given an initial amount and a percentage rate
of growth/decay.

i. Start with the basic exponential form:

$$f(x) = a(1 \pm r)^x$$

ii. Replace a with the given initial value.

iii. Replace r with the given rate, as a decimal.

iv. + if increasing (growth), - if decreasing (decay)

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Ex: Write an exponential function to model each
of the following scenarios.

1) You purchase a used car for \$9,750 and this
particular model is known to lose 9.5% of its
value each year. Write an exponential function
to express the value of the car, $V(t)$, after t years.

2) You invest \$1,500 into an account that earns
2.75% interest per year. Write an exponential
function to express the amount of money, $A(t)$,
in the account after t years.

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2) Half-life problems.

i. Start with the half-life formula:

$$f(x) = a(.5)^{\frac{x}{HL}}$$

ii. Replace a with the given initial amount.

iii. Replace HL with the given half-life

Ex: The half-life of strontium-90 is 29 years.
How much of a 250 gram sample will remain
After 35 years? 115 years? How many years
will it take for the sample to decay to 10 grams?

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Algebra 2 & Trigonometry

Writing Exponentials

Name: 1-8, on a separate sheet of paper.

Date:

1. The population of Clarkstown was 3,381,000 in 2000 and is growing at an annual rate of 1.8%.

- Write an exponential function that will model the population, $P(x)$, of Clarkstown in x years.
- What will the population be in 2004? 2010? 2015?
- In what year will the population reach 3,500,000?

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6. If P dollars are invested at $r\%$ annual interest compounded n times during the year, the amount, A , of the investment after t years is given by the equation:

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

Mary invests \$7500 at an annual rate of 8% compounded quarterly (4 Times per year). How many years will it take her, correct to the Nearest tenth, for her investment to double?

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